

What is claimed is:

1.

Sub. (An aerial launch and recovery system for unmanned aircraft, said system comprising:

a lifting apparatus for carrying said aircraft to an elevated altitude,

a tow line connecting said lifting apparatus to a base structure,

5 launching means, and

arrestment means;

said lifting apparatus being aerially deployed from said base structure, said launching means being adapted to carry said aircraft to said elevated altitude and release said aircraft for flight mode, said arrestment means being adapted to capture and retain said
10 aircraft from mid-air flight, said tow line enabling said lifting apparatus and said captured aircraft to be pulled back to said base structure.

2.

The aerial launch and recovery system of claim 1 in which said lifting apparatus is a parasail, said base structure comprising a transportable conveyance comprising a water craft capable of creating a relative wind through forward movement sufficient to provide lift to said parasail.

3.

The aerial launch and recovery system of claim 1 in which said launching means comprises a housing for releasably receiving said aircraft, said housing being attached below said lifting apparatus.

4.

The aerial launch and recovery system of claim 1 in which said launching means comprises a housing for releasably receiving said aircraft positioned on said tow line at a point remote from said lifting apparatus.

5.

(omb. The aerial launch and recovery system of claim 1 in which said arrestment means comprises a hook attached to said aircraft in such a position whereby said hook is adapted to engage said tow line as said aircraft comes into contact with said tow line.

6.

The aerial launch and recovery system of claim 1 in which said arrestment means is oriented such that said aircraft is captured from its flight path that is non-coincident to a plane in which said tow line lies.

7.

The aerial launch and recovery system of claim 1 in which said arrestment means is oriented such that said aircraft is captured from its flight path that is coincident with a plane in which said tow line lies.

8.

The aerial launch and recovery system of claim 5 in which said hook is positioned on a forward edge of a wing of said aircraft.

9.

The aerial launch and recovery system of claim 8 in which a guide spanning between an attachment on a forward portion of a fuselage section of said aircraft to said wing directs said tow line to said hook.

10.

The aerial launch and recovery system of claim 5 in which said hook is positioned on a forward inboard edge of a wing of said aircraft.

11.

The aerial launch and recovery system of claim 10 in which a guide spanning between an attachment on a forward extending member positioned towards an outboard portion of a wing of said aircraft to an inboard portion of said wing directs said tow line to said hook.

12.

The aerial launch and recovery system of claim 5 in which said hook is positioned on a section of a fuselage of said aircraft at a juncture of said fuselage section and a wing of said aircraft.

13.

The aerial launch and recovery system of claim 5 in which said hook is positioned on a propeller guard at a front of said aircraft.

14.

Comb. 5 The aerial launch and recovery system of claim 5 in which said arrestment means further comprises a harness for suspending said aircraft from its center of gravity from said tow line, said harness being attached to a top surface of said aircraft around its center of gravity, said harness having a lead end attached to said hook, said hook being detachable upon engagement with said tow line, whereby said harness is connectable with said tow line through said hook to effect center of gravity suspension of said aircraft.

15.

Comb. 5 The aerial launch and recovery system of claim 8 in which said arrestment means further comprises a pivotable arm member for suspending said aircraft from its center of gravity from said tow line, a pivot point of said pivotable arm being attached to a top surface of said aircraft its center of gravity, said pivotable arm having a distal end forming said hook, said pivotable arm being pivotable from a retracted position to an erected position upon engagement of said hook with said tow line, whereby said pivotable arm is connectable with said tow line through said hook to effect center of gravity suspension of said aircraft.

16.

The aerial launch and recovery system of claim 1 in which said arrestment means comprises:

Comb. at least one arrestment line suspended from said tow line,

a hook attached to said aircraft,

5 said hook being placed in such a position whereby said hook is adapted to engage said arrestment line as said aircraft comes into contact with said arrestment line.

17.

Comb. The aerial launch and recovery system of claim 16 in which said arrestment means is oriented such that said aircraft is captured from its flight path that is non-coincident to a plane in which said tow line lies.

18.

Comb, The aerial launch and recovery system of claim 16 in which said arrestment means is oriented such that said aircraft is captured from its flight path that is coincident with a plane in which said arrestment line lies.

19.

The aerial launch and recovery system of claim 16 in which said hook is positioned on a forward edge of a wing of said aircraft.

20.

The aerial launch and recovery system of claim 19 in which a guide spanning between an attachment on a forward portion of a fuselage section of said aircraft to said wing directs said arrestment line to said hook.

21.

The aerial launch and recovery system of claim 16 in which said hook is positioned on a forward inboard edge of a wing of said aircraft.

D 22.

The aerial launch and recovery system of claim 21 in which a guide spanning between an attachment on a forward extending member positioned towards an outboard portion of a wing of said aircraft to an inboard portion of said wing directs said arrestment line to said hook.

23.

The aerial launch and recovery system of claim 16 in which said hook is positioned on a section of a fuselage of said aircraft at a juncture of said fuselage section and a wing of said aircraft.

24.

The aerial launch and recovery system of claim 16 in which said hook is positioned on a propeller guard at a front of said aircraft.

25.

The aerial launch and recovery system of claim 21 in which said arrestment means further comprises a cable harness for suspending said aircraft from its center of gravity from said arrestment line, said cable harness being attached to a top surface of

5 said aircraft its center of gravity, said cable harness having a lead end attached to said hook, said hook being detachable upon engagement with said arrestment line, whereby said cable harness is connectable with said arrestment line through said hook to effect center of gravity suspension of said aircraft.

26.

5 The aerial launch and recovery system of claim 21 in which said arrestment means further comprises a pivotable arm member for suspending said aircraft from its center of gravity from said arrestment line, a pivot point of said pivotable arm being attached to a top surface of said aircraft its center of gravity, said pivotable arm having a distal end forming said hook, said pivotable arm being pivotable from a retracted position to an erected position upon engagement of said hook with said arrestment line, whereby said pivotable arm is connectable with said arrestment line through said hook to effect center of gravity suspension of said aircraft.

27.

The aerial launch and recovery system of claim 16 in which a plurality of arrestment lines are suspended from said tow line, with bottom ends of said arrestment lines being held apart from each other in a spaced, parallel relationship lying in a plane with said tow line.

28.

The aerial launch and recovery system of claim 27 in which said arrestment lines are held apart by a tensioning line connected to each of said bottom ends, said tensioning line having at least one end connected to said tow line.

29.

The aerial launch and recovery system of claim 28 in which said tensioning line has a free end connected to a parachute, said parachute adapted to provide an arrestment load to said aircraft upon engagement with at least one of said arrestment lines.

30.

The aerial launch and recovery system of claim 28 in which said tensioning line has a second end connected to said tow line, said first and second ends having an

elasticity to provide an arrestment load to said aircraft upon engagement with at least one of said arrestment lines.

31.

The aerial launch and recovery system of claim 16 in which a stop member is provided on said arrestment line, said stop member being adapted to prevent said hook from sliding along said arrestment line past said stop member, whereby said aircraft may be held in suspension from said arrestment line.

32.

The aerial launch and recovery system of claim 5 in which a stop member is provided on said tow line, said stop member being adapted to prevent said hook from sliding along said tow line past said stop member, whereby said aircraft may be held in suspension from said tow line.

33.

The aerial launch and recovery system of claim 27 in which top ends of said arrestment lines are connected to a spacer line slidably connected to said tow line by a plurality of suspension ring members, ends of said spacer line being fixed to a first and last respective suspension ring member, at least one of said first and last suspension ring member having a braking clamp connected thereto, said braking clamp being engageable with said tow line, whereby a braking action is capable of being imparted to said aircraft as said aircraft engages said recovery system in a direction along said tow line.

34.

The aerial launch and recovery system of claim 1 in which said arrestment means comprises a net suspended from said tow line.

35.

The aerial launch and recovery system of claim 34 in which said net is comprised of a plurality of mesh lines, a perimeter cable and a pair of draw cables, each of said mesh lines forming loops at ends thereof, said perimeter cable passing through each of said loops, each of said draw cables being connected at each end to respective top and bottom corners formed by said perimeter cable, each of said draw cables passing through a respective suspension ring member in sliding relationship, said suspension ring member

being connected to said tow line, whereby said mesh lines of said net are adapted to slide along said perimeter cable to collapse around and retain said aircraft when said aircraft engages said net from a non-coincident direction thereto, said mesh lines acting to pull
10 said perimeter cable in said non-coincident direction, whereby said draw cables are pulled through said suspension ring members to a sufficient degree to allow said retained aircraft to suspend from said tow line within said net.

36.

The aerial launch and recovery system of claim 35 in which parachutes are disposed at lower corners of said perimeter cable, said parachutes being oriented such that a drag effect is imparted on said aircraft as it engages said net from a non-coincident direction thereto.

37.

The aerial launch and recovery system of claim 1 in which a winch is provided to facilitate aerial deployment and recovery of said tow line, said winch enabling said lifting apparatus to be maintained at variable altitudes.

38.

The aerial launch and recovery system of claim 37 in which said winch is adapted to reel said tow line in and out at variable speeds to affect a load placed on said tow line by said aircraft as it engages said tow line.

39.

The aerial launch and recovery system of claim 37 in which pulleys are provided for varying the point of deployment of said tow line from said base structure.

40.

The aerial launch and recovery system of claim 2 in which said arrestment means comprises:

at least one arrestment line suspended from said parasail,

a hook attached to said aircraft,

5 said hook being placed in such a position whereby said hook is adapted to engage said arrestment line as said aircraft comes into contact with said arrestment line.

41.

The aerial launch and recovery system of claim 28 in which said tensioning line is disengageable from said tow line whereby said aircraft being held in suspension by one of said arrestment lines may be pulled onto said base structure in combination with operation by said winch pulling in said lifting apparatus.

42.

Comb. The aerial launch and recovery system of claim 28 in which a pulley is positioned on said tow line, at least one of said arrestment lines passing through said pulley and reaching down to said base structure, whereby said aircraft being held in suspension by said arrestment line may be loaded onto said base structure in combination with operation by said winch pulling in said lifting apparatus.

D 43.

The aerial launch and recovery system of claim 1 in which said arrestment means comprises a hook attached to said tow line in such a position whereby said hook is adapted to engage an arrestment line from said aircraft as it comes into contact with said tow line.

44.

The aerial launch and recovery system of claim 43 in which said tow line hook comprises a housing through which said tow line passes, said housing having means to allow sliding in a direction of increased altitude and having means to prevent sliding in a direction back along said tow line towards said base structure.

45.

The aerial launch and recovery system of claim 2 in which means are provided for varying a geometry of a canopy of said parasail, whereby air drag on said parasail may be controlled.

46.

The aerial launch and recovery system of claim 1 in which said lifting apparatus is a lighter-than-air balloon.

47.

The aerial launch and recovery system of claim 1 in which said lifting apparatus is a lighter-than-air balloon in combination within a parasail.

48.

The aerial launch and recovery system of claim 1 in which said base structure comprises a transportable conveyance comprising a wheeled vehicle.

49.

The aerial launch and recovery system of claim 2 in which rigid members support said aircraft from said lifting apparatus to minimize roll of said aircraft as it is carried to said elevated altitude.

50.

The aerial launch and recovery system of claim 3 in which rigid members support said aircraft from said tow line to minimize roll of said aircraft as it is carried to said elevated altitude.

51.

The aerial launch and recovery system of claim 16 in which said arrestment line is connected to an elastic line suspended from said tow line, said elastic line having at least one end provided with a braking clamp member engageable with said tow line, whereby a braking action is capable of being imparted to said aircraft as said aircraft engages said recovery system in a direction along said tow line.

52.

An aerial launch system for unmanned aircraft, said system comprising:
a lifting apparatus for carrying said aircraft to an elevated altitude,
a tow line connecting said lifting apparatus to a base structure, and
launching means,

said lifting apparatus being aerielly deployed from said base structure, said launching means being adapted to carry said aircraft to said elevated altitude and release said aircraft for flight mode, said tow line enabling said lifting apparatus to be pulled back to said base structure.

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Comb

Subcombination

53.

The aerial launch system of claim 52 in which said lifting apparatus is a parasail, said base structure comprising a transportable conveyance comprising a water craft capable of creating a relative wind through forward propulsion sufficient to provide lift to said parasail.

54.

The aerial launch system of claim 53 in which said launching means comprises a housing for releasably receiving said aircraft, said housing being attached below said lifting apparatus.

55.

The aerial launch system of claim 52 in which a winch is provided to facilitate aerial deployment and recovery of said tow line, said winch enabling said lifting apparatus to be maintained at variable altitudes.

56.

The aerial launch system of claim 55 in which pulleys are provided for varying the point of deployment of said tow line from said base structure.

57.

The aerial launch system of claim 52 in which said lifting apparatus is a lighter-than-air balloon.

58.

The aerial launch system of claim 53 in which said lifting apparatus is a lighter-than-air balloon in combination within a parasail.

59.

The aerial launch system of claim 52 in which said base structure is a transportable conveyance comprising a wheeled vehicle.

60.

Subcomp. An aerial recovery system for unmanned aircraft, said system comprising:
an aerial apparatus for carrying said recovery system to an elevated altitude,
a tow line connecting said aerial apparatus to a base structure, and
arrestment means;

- 5 said aerial apparatus being aurally deployed from said base structure, said arrestment means being adapted to capture and retain said aircraft from mid-air flight, said tow line enabling said lifting apparatus and said captured aircraft to be pulled back to said base structure.

61.

The aerial recovery system of claim 60 in which said arrestment means comprises a hook attached to said aircraft in such a position whereby said hook is adapted to engage said tow line as said aircraft comes into contact with said tow line.

62.

The aerial recovery system of claim 61 in which said arrestment means is oriented such that said aircraft is captured from its flight path that is non-coincident to a plane in which said tow line lies.

63.

The aerial recovery system of claim 61 in which said arrestment means is oriented such that said aircraft is captured from its flight path that is coincident with a plane in which said tow line lies.

64.

The aerial recovery system of claim 61 in which said hook is positioned on a forward edge of a wing of said aircraft.

65.

The aerial recovery system of claim 64 in which a guide spanning between an attachment on a forward portion of a fuselage section of said aircraft to said wing directs said tow line to said hook.

66.

The aerial recovery system of claim 61 in which said hook is positioned on a forward inboard edge of a wing of said aircraft.

67.

The aerial recovery system of claim 66 in which a guide spanning between an attachment on a forward extending member positioned towards an outboard portion of a wing of said aircraft to an inboard portion of said wing directs said tow line to said hook.

68.

The aerial recovery system of claim 61 in which said hook is positioned on a section of a fuselage of said aircraft at a juncture of said fuselage section and a wing of said aircraft.

69.

The aerial recovery system of claim 61 in which said hook is positioned on a propeller guard at a front of said aircraft.

70.

The aerial recovery system of claim 64 in which said arrestment means further comprises a harness for suspending said aircraft from its center of gravity from said tow line, said harness being attached to a top surface of said aircraft its center of gravity, said harness having a lead end attached to said hook, said hook being detachable upon engagement with said tow line, whereby said harness is connectable with said tow line through said hook to effect center of gravity suspension of said aircraft.

71.

The aerial recovery system of claim 64 in which said arrestment means further comprises a pivotable arm member for suspending said aircraft from its center of gravity from said tow line, a pivot point of said pivotable arm being attached to a top surface of said aircraft its center of gravity, said pivotable arm having a distal end forming said hook, said pivotable arm being pivotable from a retracted position to an erected position upon engagement of said hook with said tow line, whereby said pivotable arm is connectable with said tow line through said hook to effect center of gravity suspension of said aircraft.

72.

The aerial recovery system of claim 60 in which said arrestment means comprises:

- at least one arrestment line suspended from said tow line,
- a hook attached to said aircraft,

said hook being placed in such a position whereby said hook is adapted to engage said arrestment line as said aircraft comes into contact with said arrestment line.

73.

The aerial recovery system of claim 72 in which said arrestment means is oriented such that said aircraft is captured from its flight path that is non-coincident to a plane in which said tow line lies.

74.

The aerial recovery system of claim 72 in which said arrestment means is oriented such that said aircraft is captured from its flight path that is coincident with a plane in which said tow line lies.

75.

The aerial recovery system of claim 72 in which said hook is positioned on a forward edge of a wing of said aircraft.

76.

The aerial recovery system of claim 72 in which a guide spanning between an attachment on a forward portion of a fuselage section of said aircraft to said wing directs said arrestment line to said hook.

77.

The aerial recovery system of claim 72 in which said hook is positioned on a forward inboard edge of a wing of said aircraft.

78.

The aerial recovery system of claim 77 in which a guide spanning between an attachment on a forward extending member positioned towards an outboard portion of a wing of said aircraft to an inboard portion of said wing directs said arrestment line to said hook.

79.

The aerial recovery system of claim 72 in which said hook is positioned on a section of a fuselage of said aircraft at a juncture of said fuselage section and a wing of said aircraft.

80.

The aerial recovery system of claim 72 in which said hook is positioned on a propeller guard at a front of said aircraft.

81.

The aerial recovery system of claim 77 in which said arrestment means further comprises a cable harness for suspending said aircraft from its center of gravity from said arrestment line, said cable harness being attached to a top surface of said aircraft its center of gravity, said cable harness having a lead end attached to said hook, said hook being detachable upon engagement with said arrestment line, whereby said cable harness is connectable with said arrestment line through said hook to effect center of gravity suspension of said aircraft.

82.

The aerial recovery system of claim 77 in which said arrestment means further comprises a pivotable arm member for suspending said aircraft from its center of gravity from said arrestment line, a pivot point of said pivotable arm being attached to a top surface of said aircraft its center of gravity, said pivotable arm having a distal end forming said hook, said pivotable arm being pivotable from a retracted position to an erected position upon engagement of said hook with said arrestment line, whereby said pivotable arm is connectable with said arrestment line through said hook to effect center of gravity suspension of said aircraft.

83.

The aerial recovery system of claim 72 in which a plurality of arrestment lines are suspended from said tow line, with bottom ends of said arrestment lines being held apart from each other in a spaced, parallel relationship lying in a plane with said tow line.

84.

The aerial recovery system of claim 83 in which said arrestment lines are held apart by a tensioning line connected to each of said bottom ends, said tensioning line having at least one end connected to said tow line.

85.

The aerial recovery system of claim 84 in which said tensioning line has a free end connected to a parachute, said parachute adapted to provide an arrestment load to said aircraft upon engagement with at least one of said arrestment lines.

86.

The aerial recovery system of claim 84 in which said tensioning line has a second end connected to said tow line, said first and second ends having an elasticity to provide an arrestment load to said aircraft upon engagement with at least one of said arrestment lines.

87.

The aerial recovery system of claim 72 in which a stop member is provided on said arrestment line, said stop member being adapted to prevent said hook from sliding along said arrestment line past said stop member, whereby said aircraft may be held in suspension from said arrestment line.

88.

The aerial recovery system of claim 61 in which a stop member is provided on said tow line, said stop member being adapted to prevent said hook from sliding along said tow line past said stop member, whereby said aircraft may be held in suspension from said tow line.

89.

The aerial recovery system of claim 83 in which top ends of said arrestment lines are connected to a spacer line slidably connected to said tow line by a plurality of suspension ring members, ends of said spacer line being fixed to a first and last respective suspension ring member, at least one of said first and last suspension ring member having a braking clamp connected thereto, said braking clamp being engageable with said tow line, whereby a braking action is capable of being imparted to said aircraft as said aircraft engages said recovery system in a direction along said tow line.

90.

The aerial recovery system of claim 60 in which said arrestment means comprises a net suspended from said tow line.

91.

The aerial recovery system of claim 90 in which said net is comprised of a plurality of mesh lines, a perimeter cable and a pair of draw cables, each of said mesh lines forming loops at ends thereof, said perimeter cable passing through each of said

loops, each of said draw cables being connected at each end to respective top and bottom
 5 corners formed by said perimeter cable, each of said draw cables passing through a
 respective suspension ring member in sliding relationship, said suspension ring member
 being connected to said tow line, whereby said mesh lines of said net are adapted to slide
 along said perimeter cable to collapse around and retain said aircraft when said aircraft
 engages said net from a non-coincident direction thereto, said mesh lines acting to pull
 10 said perimeter cable in said non-coincident direction, whereby said draw cables are
 pulled through said suspension ring members to a sufficient degree to allow said retained
 aircraft to suspend from said tow line within said net.

92.

The aerial recovery system of claim 91 in which parachutes are disposed at lower
 corners of said perimeter cable, said parachutes being oriented such that a drag effect is
 imparted on said aircraft as it engages said net from a non-coincident direction thereto.

93.

The aerial recovery system of claim 60 in which a winch is provided to facilitate
 aerial deployment and recovery of said tow line, said winch enabling said lifting
 apparatus to be maintained at variable altitudes.

94.

The aerial recovery system of claim 93 in which said winch is adapted to reel said
 tow line in and out at variable speeds to affect a load placed on said tow line by said
 aircraft as it engages said tow line.

95.

The aerial recovery system of claim 93 in which pulleys are provided for varying
 the point of deployment of said tow line from said base structure.

96.

The aerial recovery system of claim 60 in which said arrestment means
 comprises:

at least one arrestment line suspended from said parasail,
 a hook attached to said aircraft,

- 5 said hook being placed in such a position whereby said hook is adapted to engage said arrestment line as said aircraft comes into contact with said arrestment line.

97.

The aerial recovery system of claim 84 in which said tensioning line is disengageable from said tow line whereby said aircraft being held in suspension by one of said arrestment lines may be pulled onto said base structure in combination with operation by said winch pulling in said lifting apparatus.

98.

The aerial recovery system of claim 84 in which a pulley is positioned on said tow line, at least one of said arrestment lines passing through said pulley and reaching down to said base structure, whereby said aircraft being held in suspension by said arrestment line may be loaded onto said base structure in combination with operation by said winch pulling in said lifting apparatus.

99.

The aerial recovery system of claim 60 in which said arrestment means comprises a hook attached to said tow line in such a position whereby said hook is adapted to engage an arrestment line from said aircraft as it comes into contact with said tow line.

100.

The aerial recovery system of claim 99 in which said tow line hook comprises a housing through which said tow line passes, said housing having means to allow sliding in a direction of increased altitude and having means to prevent sliding in a direction back along said tow line towards said base structure.

101.

The aerial recovery system of claim 60 in which said lifting apparatus is a parasail, said base structure comprises a transportable conveyance comprising a water craft capable of creating a relative wind through forward propulsion sufficient to provide lift to said parasail.

102.

The aerial recovery system of claim 101 in which means are provided for varying a geometry of a canopy of said parasail, whereby air drag on said parasail may be controlled.

103.

The aerial recovery system of claim 60 in which said lifting apparatus is a lighter-than-air balloon.

104.

The aerial recovery system of claim 60 in which said lifting apparatus is a lighter-than-air balloon in combination within a parasail.

105.

The aerial recovery system of claim 60 in which said base structure comprises a transportable conveyance comprising a wheeled vehicle.

D 106.

The aerial recovery system of claim 72 in which said arrestment line is connected to an elastic line suspended from said tow line, said elastic line having at least one end provided with a braking clamp member engageable with said tow line, whereby a braking action is capable of being imparted to said aircraft as said aircraft engages said recovery system in a direction along said tow line.

107.

A recovery system for unmanned aircraft, said system comprising an arrestment line supported from a structure having sufficient height to position said arrestment line in a path of said aircraft when in flight such that said aircraft is adapted to engage said arrestment line to enable arrestment and recovery of said aircraft on said arrestment line.

108.

A recovery system for unmanned aircraft, said system comprising a plurality of arrestment lines aligned in parallel orientation and having a spaced apart relationship to each other, said arrestment lines being supported from a structure having sufficient height to position said arrestment lines in a path of said aircraft when in flight such that said

- 5 aircraft is adapted to engage at least one of said arrestment lines to enable arrestment and recovery of said aircraft on said arrestment lines.

109.

The recovery system of claim 108 in which said support structure comprises a plurality of vertically arrayed, spaced apart posts, said arrestment lines being supported in a vertical orientation from a support spanning between said posts.

110.

The recovery system of claim 109 in which said aircraft has means for hooking said arrestment lines to enable retaining engagement therewith.

111.

The recovery system of claim 109 in which said arrestment lines have stop means for suspending said aircraft on said arrestment lines after engagement.

112.

The recovery system of claim 107 in which said arrestment line is vertically oriented.

113.

The recovery system of claim 107 in which said arrestment line is horizontally oriented.

114.

The recovery system of claim 108 in which said support structure comprises a plurality of vertically arrayed, spaced apart posts, said arrestment lines being supported in a horizontal orientation between said posts.

115.

A method for launching and recovering an unmanned aircraft, said method comprising steps of:

lifting said aircraft to an elevated altitude by means of a lifting apparatus,
connecting said lifting apparatus to a base structure by a tow line,
5 launching said aircraft at said elevated altitude, and
maneuvering said aircraft into arrestment means while in flight.

116.

The method for launching and recovering an unmanned aircraft of claim 115 in which said lifting apparatus is a parasail.

117.

The method for launching and recovering an unmanned aircraft of claim 115 in which said aircraft is launched from said lifting apparatus at a point remote from said base structure.

118.

The method for launching and recovering an unmanned aircraft of claim 115 in which said maneuvered aircraft is adapted to engage said tow line while in flight at a point on said tow line between said base structure and said lifting apparatus, said aircraft being maneuvered to engage said tow line at an angle that is non-coincident with a vertical plane formed by said tow line.

119.

The method for launching and recovering an unmanned aircraft of claim 115 in which said maneuvered aircraft is adapted to engage said tow line while in flight at a point on said tow line between said base structure and said lifting apparatus, said aircraft being maneuvered to engage said tow line at an angle that is coincident with a vertical plane formed by said tow line.

120.

The method for launching and recovering an unmanned aircraft of claim 115 in which said arrestment means are adapted to decrease an arrestment load placed on said aircraft during arrestment.

121.

A method for launching an unmanned aircraft, said method comprising steps of: lifting said aircraft to an elevated altitude by means of a lifting apparatus, connecting said lifting apparatus to a base structure by a tow line, and launching said aircraft at said elevated altitude.

122.

A method for recovering an unmanned aircraft, said method comprising steps of:
deploying a lifting apparatus to an elevated altitude,
connecting a lifting apparatus to a base structure by a tow line, and
maneuvering said aircraft into arrestment means while in flight.

123.

The method for recovering an unmanned aircraft of claim 122 in which said
lifting apparatus is a parasail.

124.

The method for recovering an unmanned aircraft of claim 122 in which said
aircraft is launched from said lifting apparatus at a point remote from said base structure.

125.

The method for recovering an unmanned aircraft of claim 122 in which said
maneuvered aircraft is adapted to engage said tow line while in flight at a point on said
tow line between said base structure and said lifting apparatus, said aircraft being
5 maneuvered to engage said tow line at an angle that is non-coincident with a vertical
plane formed by said tow line.

126.

The method for recovering an unmanned aircraft of claim 122 in which said
maneuvered aircraft is adapted to engage said tow line while in flight at a point on said
tow line between said base structure and said lifting apparatus, said aircraft being
maneuvered to engage said tow line at an angle that is coincident with a vertical plane
5 formed by said tow line.

127.

The method for recovering an unmanned aircraft of claim 122 in which said
arrestment means are adapted to decrease an arrestment load placed on said aircraft
during arrestment.